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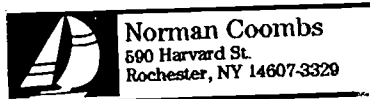
## ABSTRACT

This paper discusses the historical relationship between people with disabilities and the rest of society. It describes the period from World War I through World War II as one of humanitarianism during which the development of a limited number of adaptive devices helped people with disabilities adjust to their disabilities as much as possible. The time since World War II is described as a period in which a proliferation of organizations lobbied for a social transformation. Rather than merely training the disadvantaged to compete better, these organizations insisted that society itself had been structured in ways that caused the disadvantage. The solution was to modify society for equal opportunity, not only to better equip those who were struggling to get ahead. This paper describes the different adaptations and assistive devices that were developed, key individuals who, despite their disabilities, achieved international recognition, and changes in the social attitudes towards those with disabilities. (CR)

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# Disability and Technology A Historical and Social Perspective

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(Presentation for the Organization of American Historians held in Washington DC, March, 1990.)

The relationship between disabled persons and the rest of society has always had an ambivalent dimension. On one hand, the disabled depend on and appreciate the assistance of others in compensating for their handicaps, but, on the other hand, they often feel that the negative attitudes towards them held by society serve to increase their disabilities and enlarge their sense of powerlessness and dependence. This frequently placed the disabled person in the position of needing help while, simultaneously, resenting the helper. In response, some became angry and hostile. Others, feeling their own lack of gratitude, turned their resentment inward. Transcending the handicap through developing new personal skills or creating tools which could compensate for the disability became one way to escape from this personal and social trap. In one sense the use of assistive technology by the disabled goes back into prehistoric times. As soon as primitive humans fashioned clubs and axes to facilitate hunting and gathering, others must have designed crutches and canes to compensate for physical handicaps. Yet in 1990, the use of the term, technology, usually implies mechanical devices if not electronic inventions.

The social history of the disabled in the twentieth century can be divided into two major periods: one covering the time from World War I through World War II, and the other the time since World War II. The first period should be seen against the background of nineteenth century humanitarian movements and nineteenth century mechanization of industry. Humanitarianism provided a network of social and rehabilitation agencies which was devoted to the needy of society including the disabled. An industrial economy, besides producing convenience machines for domestic use, created a limited number of adaptive devices to help the handicapped. The thrust of these activities was to help the disabled persons adjust to their handicaps as much as possible.

The latter period occurred within the context of both the civil rights movement and the emergence of a society based on electronic and information technologies. The years following the Second World War saw the proliferation of organizations lobbying for a social transformation which would permit their members full and equal participation in society. Rather than merely training the disadvantaged to compete better, these organizations insisted that society itself had been structured in ways that caused the disadvantage. The solution was to modify society for equal opportunity and not only to better equip those who were struggling to get ahead. Electronics technology produced a multitude of products with consumer applications. Many of these devices became inexpensive and miniaturized. This permitted portable, personalized devices some of which became almost miraculous tools for the physically disabled. On one hand, the disabled began lobbying society to become more open and accessible to them, and, on the other hand, they began looking to the new technologies for devices that might empower them to

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function on a more equal basis with the rest of society.

At the Beginning of the twentieth century, society had been reshaped by the growth of humanitarianism which led to an expanded concern for the problems of physically and mentally disabled people. The neglect or brutal mistreatment of previous ages was replaced with the establishment of special facilities providing care and maintenance. This was a kind of warehouse mentality. Hospitals, asylums and special institutions had been built and staffed which, while providing minimal care, segregated and isolated them from the rest of society. While those who would have suffered from neglect were better off, others who might have struggled towards independence were prevented from testing their potential. The goal was care rather than rehabilitation or restoration.

In the middle of the nineteenth century the New York Association for Improving the Conditions of the Poor (founded 1843) attempted to meet the social needs of U.S. cities by training and supervising volunteers to visit the poor, the unemployed and the disabled. At about the same time, the Perkins School for the Blind was established in Watertown, Mass., and Thomas Hopkins GALLAUDET, began the first school for the deaf in the United States, now known as The American School for the Deaf, in Hartford, Conn. In 1889, Jane Addams had established Hull House in Chicago to provide social services to underprivileged immigrants helping them to adjust to American society. Thereafter, the field of social work grew rapidly and provided the framework for the twentieth century social welfare system including the development of rehabilitation services.

With the arrival of the industrial revolution, almost everyone had become comfortable with using machines and began to conceptualize the world in mechanical terms. The Newtonian universe is generally understood to portray a mechanistic world view. People began to think of human anatomy as a kind of machine, and it was an easy step to develop more sophisticated, artificial arms and legs for those needing the use of a prosthesis. Mass production of wheelchairs became another creation of the mechanical age. While spectacles have become so common as not to be thought of as an aid for the disabled, they do function, in fact, in the identical manner. Eye glasses have become so common and, for many, totally compensate for the reduction of vision that no one considers their users as disabled. This is to say that the concept of the physically disabled is, in part, socially defined.

World War I was a landmark in the social history of the disabled with the movement away from purely custodial services to ones emphasizing rehabilitation. Many soldiers were returning without limbs, sight, or hearing, and they were not prepared to be shut away for the rest of their lives. Society felt an obligation to attempt to compensate them for the price they had paid for the nation's security. The government passed the Soldier's Rehabilitation Act in 1918 to provide vocational retraining of handicapped veterans. This legislation accepted a social responsibility for the disabled soldiers in a way that had not been true after any previous war. It reflects both a broadened humanitarian spirit and the existence of trained social and rehabilitation personnel to staff the newly legislated system. Soon thereafter, the Vocational Rehabilitation Act of 1920 extended the same benefits to civilians.

The organization of Disabled American Veterans was founded in 1921 by Judge Robert S. Marx and became the vehicle for disabled soldiers to have a voice in their own rehabilitation. Veterans were not the only members of the disabled community who sought to shape rehabilitation services. Many of the early organizations to assist handicapped persons were initiated by

those with disabilities themselves. For example, The Association for the Blind and Visually Impaired of Rochester New York had its roots in the creation of the Rochester Cooperative Association for the Blind begun by four graduates from the nearby State School for the Blind at Batavia. They founded the organization so that they could provide newly blinded adults with the skills needed for becoming independent. Such organizations quickly became controlled by professionals and required financial support by the community to pay for facilities and professional staff. Decisions soon became the province of the experts and of community boards of directors rather than of the disabled. The New Deal programs expanded the scope of these services to the disabled along with the development of a host of other federal welfare programs. While this meant the availability of more assistance, it also meant that policies were now shaped by government officials as well as by professional rehabilitation personnel. As important as these services were for the welfare of the handicapped community, the fact that basic life decisions were being made by others for the disabled served to increase their sense of powerlessness and dependence.

World War II Impacted American society in many diverse ways. Women, minorities and some disabled persons were integrated into the workplace as never before. They found paid employment gave them a sense of worth, and they clearly benefited from the income. They were not eager to give up these new opportunities to the men returning from the front lines. Among the men who came home were still larger numbers of disabled soldiers who were injected into the American society. While the ranks of the handicapped were growing and the problem becoming larger, America emerged from the war as the world's most industrialized and wealthy nation. Not only did America feel it had the ability to fulfill the aspirations of the workers at home and the returning veterans, America saw itself having to fill the role of world champion of democracy and humanitarianism. During World War II, it had played that role in opposition to nazi racism, and it continued to portray itself in that light in contrast to Russian communism. While this spirit was embodied in legislation granting all returning veterans the right to government assistance in attending college or purchasing homes, disabled veterans were entitled to even more generous rehabilitation services than after World War I. These expanded rehabilitation opportunities were usually opened to handicapped civilians as well.

When the newly established United Nations Organization set forth its universal declaration of human rights, the United States sought to portray itself as the world leader of such enlightened views. While some Southern senators were worried about the possible loss of national sovereignty and states rights, African Americans became more optimistic that this humanitarianism would lead their country to live up to its own promises. In 1954 the Supreme Court encouraged this view when it declared that school segregation was unconstitutional. The following year, the Rev. Dr. Martin Luther King Jr. became the leader of the Montgomery bus boycott to begin the challenge of the entire edifice of legal segregation. Blacks had struggled to develop skills and education during the previous decades with the hope that they could compete on an equal basis in society. By the 1950s they shifted their tactics to pressure the White-dominated society into granting them the equal rights guaranteed in the Constitution. In the subsequent years, women and other ethnic groups organized civil rights movements of their own. Disability organizations similarly, began to proliferate and to change the focus of their activities. While not as common as some of the other protest demonstrations, there were protest marches consisting of disabled persons with crutches, white canes and wheelchairs.

Disability advocacy groups petitioned Congress and state

legislatures for two kinds of legislation. On one hand, they wanted civil rights legislation which outlawed discrimination by government agencies and by employers to be expanded to include prohibiting discrimination against the handicapped. On the other hand, they wanted the passage of laws aimed at guaranteeing "equal access" to programs and facilities. Architectural design was a barrier for those with mobility impairments. When essential information was only available in print, it was a barrier to the visually impaired. Similarly, when important material was presented orally, it was not accessible to the hearing impaired. Defining and enforcing such provisions was and is difficult. Many institutions were frightened at the possible expense it could necessitate. This was usually recognized by a clause requiring only "reasonable" compliance. Many were reluctant to initiate these changes as they seemed to only serve the needs of a very small population. Statistics on the number of disabled persons are very unreliable. Many disabled persons do not like to count themselves among such a disadvantaged group and avoid being counted. Organizations to assist the disabled have a vested interest in making the statistics appear larger so they can fight for more funding.

Interestingly, the uses of facilities designed to alleviate the difficulties of the physically disabled were often more widespread than imagined. Side walk curb cuts are used more by women with Carriages than by the mobility impaired. The presentation of material in both print and oral form serves more than the needs of the blind and the deaf. Educators are increasingly aware that people learn differently. Some comprehend material better in text format while others learn best by the spoken word. Adaptations originally made to assist a special group were conveniences appreciated by society at large.

At the same time as disability advocacy groups were demanding a voice for the handicapped in shaping their lives, space age electronic and materials technologies were providing still another form of empowerment. War is not only a time of devastation, it is a time when all kinds of technical and scientific advances are stimulated. The multitude of physical and mental problems resulting from wartime provide the field of medicine with unusual opportunities to learn and grow. Along with the increase in medical need came an increase in medical skill and ability. Doctors developed new procedures, and producers of medical devices and drugs developed amazing new tools to assist them. The cold war provided a continuing incentive for the military to further stimulate technological innovations. In 1948, the transistor was invented by Walter H. Brattain, John Bardeen, and William Shockley at Bell Laboratories and began an entire electronics revolution. Sputnik 1 was launched from the BAIKONUR COSMODROME on Oct. 4, 1957, and the Russians initiated a Cold War space race which further stimulated technological developments. NASA, the National aeronautics and Space Administration has as part of its official mission the encouragement of technology transfer from military to civilian uses. The artificial heart pacemaker, invented in 1958 by Wilson Greatbatch, is one of its best known achievements in the field of medicine and disability technology.

The list of such devices is long and varied. Computerized voice recognition devices, for example, help paralyzed persons use words to control their environments. These machines are activated by verbal commands and can--among other things--enable users to dial telephones, turn fixtures on and off, and even write checks and letters. Other recent technological advances include: computerized devices that can read printed documents aloud; specially adapted "talking" computer terminals that enable blind persons to gain access to data banks; sip-and-puff air tubes that control the movements of motorized wheelchair, and computerized electronic grids attached to video cameras that



translate eye movements into speech.

Central to most of these adaptive devices is some kind of computer or microprocessor. This implies that many of the disabled can have access to computers and the whole new information society which is being born today. The competitive edge in our economy will go to those who can access and manipulate electronic information. Many disabled persons see the possibility of a new access to opportunity and an exciting personal independence in the near future, but they also worry that new generations of computer equipment might be thoughtlessly designed in ways that could shut them out again. This is where advocacy organizations continue playing an important role in impacting the shape of society so it will not contribute to their handicap. At this moment the House of Representatives is considering the Americans with Disabilities Act, and various advocacy groups have been petitioning congress to extend civil rights to include the disabled. Last week a group of people with a variety of handicaps staged a protest at the Capitol on behalf of this legislation. One of the speakers was King Jordan the hearing-impaired president of Gallaudet College who said that we are simply asking for the same rights and equality any other American has. Some of the participants engaged in civil disobedience, and over 100 were arrested by the Capitol police.

During the twentieth century, there have been a few disabled persons who, in spite of their handicaps, have achieved international recognition. Franklin Delano Roosevelt, in spite of being paralyzed, was the only four-term president of the United States and was one of the key world leaders in the crisis of World War II. Perhaps the most famous story of personal triumph over severe disabilities is the story of Helen Keller. Yet, as impressive as was her achievements, the triumph was also one of patience and persistence on the part of her teacher and friend, Ann Sullivan. Helen's story was also Ann's story.

What many disabled persons find exciting about the new technological devices is the possibility of both achievement and independence. Steven Hawking is an example of what can be accomplished by the human spirit in conjunction with state-of-the-art technology. A preeminent scientist, the British physicist Stephen W. HAWKING, has been confined to a wheelchair for many years with Lou Gehrig's disease (amyotrophic lateral sclerosis). Since 1985, Hawking has been unable to speak; he now communicates with a computerized speech synthesizer attached to his wheelchair. Hawking continues to write books and still travels and lectures extensively.

Over the course of this century, the attitude of the disabled towards the rest of society has undergone a fundamental shift in focus. At first, they looked to the humanitarian spirit which at emerged to provide them with paternalistic assistance. They hoped for training and tools to help them to cope with their handicaps and with their struggle to survive in a competitive world. As it became clear that paternalism itself contributed to their powerlessness and disability, they followed the lead of other interest groups in demanding that the social and economic structure be made more equally accessible. New technologies also gave promise of better equipping them to compete if and when equal access was provided. What the disabled were asking society for was not so much humanitarian assistance as it was human empowerment.

In 1990 empowerment for the disabled means equal access to opportunities and the development of technologies to compensate for the physical impairment. Leaders in the disabled community are working to develop the dignity which comes with independence and self determination. As much as the physically impaired

continue to look to society at large for understanding and support, they have a new realization that the real empowerment is something they must do for themselves.



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